

1 In the claims:

- 2 1. A flex circuit for use in a fuel cell, the flex circuit, comprising:  
3 a fuel-side flexible circuit, comprising:  
4 a first flex substrate, wherein the first flex substrate comprises openings  
5 through which pass liquid fuel,  
6 a first porous layer adjacent the first flex substrate, the first porous layer  
7 including a first catalyst layer,  
8 an anode electrode between the first flex substrate and the first porous  
9 layer, and  
10 a boundary layer disposed adjacent the first porous layer, the boundary  
11 layer preventing cross-over of the liquid fuel;  
12 an air/water-side flexible circuit, disposed in parallel with the fuel-side flexible  
13 circuit, comprising:  
14 a second flex substrate, wherein the second flex substrate comprises  
15 openings through which pass water,  
16 a second porous layer adjacent the second flex substrate, the second  
17 porous layer including a second catalyst layer, and  
18 a cathode electrode between the second flex substrate and the second  
19 porous layer; and  
20 a center section disposed between the first and the second flex circuits, wherein  
21 the first and the second flex substrates are conformable to non-planar shapes.  
22 2. The flex circuit of claim 1, wherein the center section is a proton exchange  
23 membrane.  
24 3. The flex circuit of claim 1, wherein the center section is a channel carrying  
25 dionized water, the center section further comprising spacers to maintain a separation  
26 between the fuel-side flexible circuit and the air/water-side flexible circuit.  
27 4. The flex circuit of claim 1, wherein the flex circuit is formed in a shape of a  
28 cylinder.  
29 5. The flex circuit of claim 4, wherein the liquid fuel is contained within an interior of  
30 the cylindrical flex circuit.





- 1 24. The method of claim 23, further comprising the step of coating the catalyst layer  
2 with a thin layer of proton transfer membrane.

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